DOCUMENT RESUME

ED 133 897 EA 009 156

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TITLE Small Classes? "What Research Says About Effective Class Sizes and Possible Alternatives to Small Classes."
INSTITUTION Heartland Education Agency, Ankeny, Iowa.
PUB DATE Jan 77
NOTE 14p.

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS Academic Achievement; *Class Size; Cross Age Teaching; Differentiated Staffs; Educational Quality; Educational Research; Elementary Secondary Education; *Literature Reviews; Nongraded System; *School Organization; *Small Classes; Teacher Aides; Team Teaching

ABSTRACT

Research findings identifying the most effective class size are found to be inconclusive. Some studies have found small classes more effective, others have favored large classes, and some have found no differences in learning effectiveness due to class size. A number of these studies are cited and points of agreement noted. In a second section alternative organizational schemes are described that might be suitable for school systems faced with declining enrollments. (MLF)

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Small Classes?

"What research says about effective class sizes and possible alternatives to small classes."

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JANUARY 1977

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AN EFFECTIVE CLASS SIZE

The most effective class size has been an area of interest for educators for many years. This interest has often resulted in a debate between two factors - educational cost and educational quality. The financial benefits of large classes are evident. The larger a class can become, the fewer number of teachers are needed to assist students. But at the same time administrators and teachers are concerned about diminishing quality education if classes become too large. Thus, for the past 50 years educators have sought an answer as to the best class size for teaching.

The research findings for identifying the most effective class size is inconclusive. Some studies have found small classes more effective, others have favored large classes and some have found no differences in learning effectiveness due to class size.

Shapson (1972) did discover several factors related to learning when changing the class size. These factors were: the criteria of success, the original class size, the subject being taught, the teachers' potential of working with small classes by using the appropriate method of instruction, and finally the teachers' feelings and attitudes toward class size. He concluded that there was no single optimum class size applicable to all situations. His research suggests that rather than one rigid class size policy that a flexible approach be adopted. Class size should be appropriate to fit the different situations arising in the schools.

One of the most complete studies regarding class size was done by Ian Templeton (1972). This author reported conflicting results concerning the most effective class size. Several studies, such as Coleman (1971), reported that minor changes in pupil/teacher ratios result in insignificant achievement gains. Another study completed at Clark High School, Las Vegas, Nevada, found the classes between 24-27 students and classes between 45-52 students showed

no significant difference in academic achievement in Business Law or Introduction of Business classes, but that a significant difference did occur in the Government course. They concluded that the contributing factors were subject matter and the instructor's teaching methods. In this study no significant differences in attitudes were found for any of the classes regardless of size.

In a study done by Johnson and Scrivens (1967), 7,500 students in 265 English and mathematic classes were studied. The results indicated that the gains contributed to class size were generally very small and inconsistent. Cory(1967), and Hoper and Keller (1966) reported that the relationship between class size and student achievement were insignificant.

There are many studies that will show that the class size is important. Woodson (1968) found a small inverse relationship between academic achievement and class size. Students in the smaller classes made greater achievement. He observed that the relationship is smaller for pupils of higher scholastic potential than it is for pupils of lower scholastic potential. He concluded from his study that the practice of using "average class size" as a lone measure of determining class size tends to oversimplify this relationship with pupil achievement.

Vincent (1968) found that classrooms with more students received more negative ratings when observing for classroom characteristics such as individualization of instruction, interpersonal regard, creativity and group activity. He found greater differences at the elementary level than the secondary level.

He studied classroom climate in over 4,000 elementary and secondary classrooms but did not examine student achievement. He found elementary classes of 11 to 15 more positive than larger classes, and classes of 16 to 20 or 21 to 25 more positive than larger classes but less positive than the smaller classes. At the secondary level classes of 11 to 15 students were more positive than classes of 16 to 20 students. No other significant differences were found at the secondary level.

Vincent studied 18,528 classroom observations using the Indicators of Quality as the criterion of classroom quality. He concluded that the variables that were important for classroom quality were: 1) Style of educational activity; 2) Subject taught; 3) Class size; 4) Grade level; 5) Type of teacher, substitute or regular; 6) Number of adults in the classroom; 7) Day of the week that the class is taught. He found that the smaller class sizes produced significant higher scores than larger classes and that there are certain breaking points in the teacher/student ratio at which the performance declines. These breaking points correspond with what Vincent found.

A five-year study that examined the relationship between the class size and pupil achievement in reading and arithmetic was reported by Furno and Collins (1967). They stated that two-thirds of the smallest class size groupings (1-25) made the greatest achievement gains as measured on standardized tests.

A comprehensive study involving class size was carried out at Columbia University (1968). Almost 20,000 classrooms were studied. The research was not concerned with pupil outcome. In general, although class size was not the most important variable, the quality of education was found to be better in small classes than in large classes. Breaking points were found which suggested that reducing a class from 27 to 26 had no effect on the quality of education. While the reduction from 26 to 25 had a favorable effect. The Columbia study also found that the effect of class size depended on the subject being taught and the method of instruction being used.

A study conducted by the Baltimore Public Schools (Furno, 1967) showed that 267 articles, thesis and dissertations dealt with class size. Eighty-five of these were based on research but only 22 survived criteria as acceptable research. Eleven of these studies examined pupil achievement. From this sample he found that five studies favored small classes, three favored large classes and three were inconclusive. Small class sizes were favored primarily for two reasons: 1) Pupils were more apt to receive individual attention and 2) educational

accidents were reduced.

An examination of the literature discussing appropriate class sizes appears to agree on several points. Some of these are listed here for the reader's examination. Research suggests that slight reductions in class size, for instance from 32 to 30 students, will probably produce little difference in student achievement but will likely produce an improvement in the teacher attitude and performance. Much of the literature argues that the reduction in class size cannot be considered separate from accompanying economic implications. It is also implied that the nature of the evaluative criteria may influence conclusions on the effect of reducing class size. Teaching methods and scheduling practices are two considerations that complicate the problem of identifying the most effective class size.

It is debatable if small classes are superior to large classes. Small classes are generally favored because there is 1) more interaction between students and teachers, 2) the goals for small classes are superior to large classes because more individual attention is given and 3) individual student characteristics are taken into consideration more often with small classes.

A summary of the literature (Sitkei, 1968) finds that:

" 1) There are twice as many studies in favor of smaller class sizes than larger class sizes, but no best class size is reported.

2) There is a great deal of variation among school systems and researchers as to what they mean when they speak of small and large classes.

3) The literature indicates that a general measure of staff adequacy is a better predictor of school quality than average class size.

4) Small classes tend to use more instructional methods than do larger class size.

5) Desirable practices tend to be dropped when the class sizes are increased. Desirable practices are added when class size is reduced.

6) Nonclassroom personnel are at least as important as teachers.

7) If the teacher is not informed of changes in class size policy, the results are generally poorer than if the teacher is aware of the situation."

Some alternatives to larger classes have been proposed. Some schools have used team teaching. Others have examined the use of various grade arrangements, double-class classrooms, accelerated promotions, greater use of paraprofessional and divided class days. The research on class size is not conclusive when achievement measures are used as the criterion. Studies have shown that teachers prefer smaller classes and that the learning environment is more positive in classrooms with fewer students.

Many variables are present in classroom environment such as the pupils, the teacher, the subject matter, the method of instruction, etc. The available research seems to indicate that these variables are more important than class size. Many studies have failed to control these variables, which may be the reason for the inconsistent results that have been obtained. It is difficult to assess the effect of class size itself. One thing is certain. Many variables go into determining a quality classroom and the school district should not make a policy based strictly on class size. Several variables need to be considered when deciding the best class size for teaching.

Educational variables that need to be carefully examined before deciding the most appropriate class size are:

1) Subject matter taught
2) Teacher attitude
3) Reasons for changing class size
4) Economic implications
5) Teaching methods
6) Scheduling procedures

When considering a change in class size policy, a school district will investigate the effect it may have on teaching morale and student learning environment. Before any policy is adpoted, the school district should research its own school to find out if they already have the optimum size classes or if something should be done.

Alternatives to Small Classes

The school system which is faced with a decreasing enrollment may wish to examine other organizational patterns. When it becomes too costly to maintain a single classroom per grade, alternative organizational schemes are possible.

No alternative organizational structure should be adopted strictly with the intent of increasing the teacher/student ratio. Any changes in organization should be examined in light of the local school setting and the educational benefits of the change. Some alternatives to organizing the school are the nongraded school, multi-age grouping, team teaching, teacher aides, and differential staffing.

Nongrading recognized that children learn at different rates and in different ways. This system allows students to progress at their own individual rate rather than with a class. In a sense, the non-graded school is a return to a much earlier organizational design. Before the middle of the 19th century, most schools were of a non-graded nature. The one-room school house, prevailing in the United States in the early part of the 20th century, followed a non-graded pattern. Therefore, non-graded schools are not new to the educational scene.

The completely non-graded school would have no grade levels in the school system. Students might be grouped in a number of ways; according to interest, according to subject matter, or according to ability and/or achievement. They might also be grouped differently for different subject areas. Students who progress at a more rapid rate move more quickly through the system. Slower students progress at their own individual learning rate. Under this system, students do not fail. Instead, students are not promoted on to more difficult work until they have mastered the necessary skills.

In a non-graded setting two or three teachers might be able to handle what normally would be considered as four, five or six grade levels. For

example, two teachers could teach 45 youngsters between 5 and 9 years old. This would be a lower elementary non-graded unit. A difficulty with the non-graded schools is that it appears to take careful planning on the part of the teachers and a great deal of communication between teachers working in the unit.

Multi-age grouping is similar to the non-graded school and the two systems could be used together. In the multi-age grouping plan, students are grouped according to their age. An example would be that seven, eight and nine year olds might be grouped in one class. Under this system, it is feasible that one teacher could handle students of several ages. Therefore, by combining groups of students the small class size would be increased with the new grouping of students.

In the non-graded school, children usually work together according to their interests, abilities and needs regardless of age. In the multi-age grouping students may be grouped temporarily within a smaller range of ages. Pupil-team learning, that of one student working with another student, is generally practiced as a part of multi-age groupings. Like any organizational plan, multi-age grouping will not work equally well for all types of learning nor with all kinds of children.

Activities used in multi-age grouping must be carefully evaluated by the instructors. The difficulty of getting multi-age groupings to work may also be true with non-graded systems. It is possible in the multi-age organizational structure that teachers need not team teach. Each teacher could teach in a self contained classroom with students of different ages.

Multi-age grouping might combine classrooms. That is, first and second grade students, third and fourth grade students, and fifth and sixth grade students are grouped together for instruction.

Team teaching is not intended as a technique to reduce the teacher/student ratio. It is an approach to provide the teachers the opportunity to work

together. Nevertheless, if a school adopts a non-graded system, they will need to examine team teaching as a technique for organizing their staff. A chief value in team teaching is making the best use of different teachers' styles. Those teachers who can work in a large group setting are encouraged to do so, and those teachers who work best with small groups, or inquiry groups, are given responsibility of working with small groups. Those teachers who have a particular interest in a subject may be better prepared to teach that particular unit. Team teaching does make the best use of teacher skills.

The key to success in team teaching lies in cooperation, planning and personal flexibility. It is probably a technique which could be used in schools faced with declining enrollment.

The use of teacher aides can assist in reducing the cost of small classes. This is done by taking two classrooms, which have 15 students and two teachers; combining them into one classroom with 30 students with one teacher and a teacher aide or para-professional to assist the classroom teacher. The use of teacher aides has resulted in some criticism from professional teachers' associations. This criticism is justified when the teacher aide is used as a substitute for the teacher. If teacher aides are used, their function must be clearly identified and their responsibilities outlined. Teacher aides are used often in multi-unit schools and with team teaching.

It does appear that the use of para-professionals in education is on the increase. This is paralleling the use of para-professionals in other professions.

Differential staffing and team teaching often go together. Team teaching may be an introductory step to differentiated staffing. A differentiated staff is one which might be composed of a master teacher, a senior teacher, a staff teacher, an associate teacher and teachers' aides. One possible use for utilizing differentiated staffs with decreasing enrollment is to assign a group of students to a teaching staff. The staff would then decide how best to assign students to teachers. It is conceivable that a differentiated staff

would have a teacher ratio of 1 to 22. Therefore, if a school had 220 students they would be permitted a staff of 10. The staff would then decide how to organize the learning environment for those 220 students. If the following year the enrollment dropped to 198 students, the staff would be reduced by one. This could possibly keep the teacher/student ratio fixed for a school building but not necessarily for classroom per teacher. It is obvious that one problem to differentiated staffing is to determine the levels of responsibility of teachers, assigning duties to those respective levels and assessing teaching competencies needed to fill those levels.

It is unknown by this writer if any of these techniques are presently being used to assist in solving the decreasing enrollment problem. Nevertheless, it is feasible that these various organizational designs or combinations of them could be used to assist in solving the problem of decreasing enrollment. It is stressed that the overriding decision to use a particular organizational design should not be totally based on decreasing enrollment. The educational environment for the students should always be the primary concern. It is also suggested that school administrators and classroom teachers cooperate in finding the solutions to the declining enrollment. It is believed that the best solutions will be jointly reached rather than arbitrarily decided by either administrators or teachers.

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